

### **REMARKS/ARGUMENTS:**

Applicants wish to thank the examiner for the careful consideration given the present application as reflected in the Office action of November 28, 2007. In this connection, Applicants note the withdrawal by the examiner of the following: objections to the drawings; the objection to matter previously added to the specification; the claim rejections based on 35 U.S.C. 112, first paragraph; and the claim rejections based on 35 U.S.C. 112, second paragraph. The claims have been carefully reviewed in light of the Office action and have been amended as necessary to more clearly and particularly describe the subject matter which Applicants regard as the invention. In this regard, claims 26 through 45, 47 and 49 previously in the case remain in the case and a discussion of why these claims are patentable over the prior art is set forth below, newly submitted claims 51 through 56 further define the invention as comprising a dental instrument adapted to perform a dental procedure, and newly submitted claims 57 through 63 relate to the performance of a dental procedure using a dental instrument as defined in one or more of claims 51 through 56.

#### **Rejections Based on Prior Art**

Claims 26, 27, 30-36, 43-45, 48 and 49 have been rejected under 35 U.S.C. 102(b) as anticipated by US Patent No. 5,725, 932 to Iio et al. (hereinafter referred to as "Iio"). It is first noted that claim 48 has been cancelled by this Amendment. As far as the merits of the rejection of the other claims are concerned, the examiner is respectfully requested to consider that these claims require that there be at least one cutting edge and/or tothing provided in the outer surface of the part of the working member that is made from a ceramic material such that the at least one cutting edge and/or tothing is adapted to perform a cutting function. The ceramic substrate of Iio does not have cutting edges and/or tothing provided in the outer surface of the substrate of the ceramic substrate as required by the claims. Necessarily then, the ceramic substrate of the tool of Iio does not have a cutting edge and/or tothing that is adapted to perform a cutting function. It is diamond particles in the coated diamond surface of the ceramic tool of Iio that perform a cutting function as distinguished from Applicants' invention where at least one cutting edge and/ or tothing is provided in the outer surface of the ceramic part of

the working member and is adapted to perform a cutting function. This is the same distinction that exists between Applicants' invention and Japanese Publication Number 05309102 that was applied against the claims in an earlier Office action but dropped in the most recent Office action. Also it is the distinction that was earlier discussed with the examiner and which the examiner in the interview summary of September 24, 2007 indicated appeared to be a patentable distinction over Japanese Publication Number 05309102 and, correlatively, Iio as well.

With respect to claims 28 and 29, Iio contains no disclosure concerning the dimensions of the radii of all geometrically created form transitions in the instrument. Consequently, Iio does not anticipate these claims.

With respect to claims 30-33, the claims define a core reinforcement structure that is established by reducing the depth of grooves or cuts made to provide the at least one cutting edge and/or tothing. Since the Iio patent does not include grooves or cuts made to provide at least one cutting edge and/or tothing, it necessarily follows that the tool of Iio would not have a core reinforcement. Consequently, it is not the case as alleged by the examiner that Iio can be interpreted as including such a structure.

With respect to claim 34, which requires that the surface of the ceramic part of the working member be microhardened, the examiner alleges that "the micron sized roughness [of Iio] is deemed to meet the vague 'microhardening' limitation". Applicants respectfully disagree. The limitation in claim 34 requires that a structural feature of the ceramic part, i.e., its microhardness, be enhanced. This is not a vague limitation. The property of "microhardness" is well known as evidenced for example in a discussion of the property in US Patent No. 5,177,999. Further, microhardness has to do with the hardness of the instrument and not its surface roughness and the examiner has not shown that microhardness can be related to surface roughness to support his conclusion that the surface roughness of Iio inherently produces a microhardened property or characteristic.

Claims 26-36, 42, 45 and 47-49 have been rejected under 35 U.S.C. 103(b) as unpatentable over Japanese Publication Number 02-180517 to Shigeyasu (hereinafter referred to as "Shigeyasu"). Again it is noted that claim 48 has been cancelled by this Amendment. The examiner alleges that Shigeyasu discloses a surface roughness of his instrument of 0.3  $\mu\text{m}$ . This is incorrect. The surface roughness disclosed by Shigeyasu is

0.3  $\mu\text{m}$ , a dimension, of course, that is one thousand times smaller than 0.3  $\mu\text{m}$ . Consequently, the range of roughnesses claimed by Applicants (0.5  $\mu\text{m}$  to 6  $\mu\text{m}$ ) is 1,667 to 20,000 times greater than the roughness taught by Shigeyasu. Obviously, the roughnesses set forth in Applicants' claims constitute more than a "value slightly outside of the range specified by Shigeyasu" as asserted by the examiner. With respect to the limitations in claims 28 and 29 having to do with geometrically created form transitions, contrary to the examiner's identification of those limitations as having to do with rounding of the cutting edges of the instrument, as stated in the paragraphs added at line 21 of page 8 of the specification in Amendment "B", "[t]he reference to geometrically created form transitions refers to any line on the ceramic part, other than a cutting edge, that is formed by the intersection of two surfaces at an angle of other than 180°." (Emphasis added). With respect to the limitations in claims 30-33 having to do with "core reinforcement", and the limitation in claim 34 having to do with "microhardening", Applicants' remarks above concerning similar limitations in the claims as contrasted with Iio and Shigeyasu are equally applicable to claims 30-33 and 34 in relation to Shigeyasu.

Claims 37-41 have been rejected under 35 U.S.C. 103 (a) as unpatentable over Shigeyasu in view of Kumar (US 2002/0028422) and also as unpatentable over Kumar in view of Iio. Because claims 37-41 are either directly or indirectly dependent on claim 26, combining the teachings of Shigeyasu and Kumar on the one hand, or Kumar in view of Iio on the other hand, does not render claims 37-41 unpatentable at least for the reason that claim 26 is distinguishable over both Shigeyasu and Iio as discussed above. Additionally, claims 38 and 39 include a limitation concerning the surface roughness of the depth marks that is not taught by Shigeyasu, Kumar or Iio.

### **Newly Submitted Claims**

Newly submitted claims 51 through 56 particularly require that the rotating instrument comprises a dental instrument that is adapted to perform a dental procedure. The various drill bits and the like disclosed in the prior art do not comprise dental instruments nor do the teachings of the prior art make obvious the application of those teachings to dental instruments. The working environment, the materials worked on, i.e., dental features in the case of a dental instrument as opposed to metal components, the

different temperature ranges to which dental tools as opposed to machine tools are subjected as well as the working conditions that are applicable in the different circumstances, are all such that it would not be obvious to one skilled in the art to apply the prior art teachings related to machine tools to a dental instrument. As far as newly submitted claims 57 through 63 are concerned, the foregoing observations concerning the differences that are related to machine tools and dental instruments are equally applicable to claims 57 through 63.

Concerning the surface roughness of the dental instrument, the examiner is respectfully requested to consider carefully the differences between the range of roughnesses recited in Applicants' claims and the range of roughnesses taught by Iio and Shigeyasu. These differences are not merely a matter of choice nor are they differences that would be obvious to one skilled in that art. With ceramic surgical instruments such as dental tools, the notch effect which is a reflection of the surface roughness of the instrument is important. If the surface roughness is too great, micro-notches will be present and these micro-notches can result in the breakage or failure of the dental instrument. Also, the dental instruments are to be used a number of times so that they must be cleaned between uses for the purposes of disinfecting and/or sterilizing the instruments. If the roughness of an instrument is too great, the surface of the instrument cannot be cleaned effectively. In addition, during a dental procedure, chips and the like of dental material such as bone chips can adhere to the surface of the instrument and prove difficult to remove. These several considerations require that the surface roughness of the instrument be optimized so that the instruments may be effectively used, and Applicants' claims recite a range of roughnesses that accomplish these desirable objectives.

### **Conclusion**

It is respectfully submitted that the claims pending in the present application are patentable for the reasons set forth above, and the Examiner is respectfully requested to allow the claims and issue a notice of allowance. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. HOEF-37546.

Respectfully submitted,

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